



# BarthHaas®

# LUPOMAX®

## Safety Data Sheet

### CHARACTERISTICS

LUPOMAX® enriched hop pellets are a natural hop product, concentrated in the resins and essential oils that give hops their distinctive character. They provide intense hop flavors and aromas combined with a decrease in vegetal and grassy attributes. LUPOMAX® pellets are produced via the mechanical enrichment of lupulin under highly controlled conditions and low temperatures to protect the sensitive hop components. They can be introduced into the brewing process anywhere Type 90 (T90) hop pellets are employed, but best practice is addition late in the kettle boil, to the whirlpool, or preferably as a dry-hop addition during fermentation or maturation. LUPOMAX® pellets are hand selected for quality each crop year, gently processed, and designed for maximum consistency.

Supported by a long history of safe use in brewing, and in accordance with US FDA Regulations 21 CFR 170.30(c) and 170.3(f), LUPOMAX® hop pellets are generally recognized as safe (GRAS).

### PRODUCT SPECIFICATIONS

**Description:** Cylindrical pellets of approximately 6 mm (0.24 inch) diameter

**Consistency:** A formed solid that will generally disintegrate into a powder during use

**Color:** Ranges from dark green to olive green (variety dependent)

**α-acids:** Standardized to meet a predetermined and narrow specification range (variety dependent)

**β-acids:** Variety dependent

**Hop Oils:** Variety dependent

**Moisture:** 7 - 12% (Variety dependent)

### QUALITY AND FOOD SAFETY

John I. Haas, Inc., maintains quality management systems registered to the ISO 9001 standard, as well as food safety management programs based on internationally recognized (HACCP) principles. Please refer to our web site ([www.johnihaas.com](http://www.johnihaas.com)) for more information on our systems and programs.



## PRODUCT USE

LUPOMAX® pellets are designed to provide consistent hop aroma and flavor that will vary depending on the point of addition within the brewing process. They will also contribute to beer bitterness when added to the kettle or whirlpool, where the amount of bitterness introduced will be dependent on factors such as temperature, time, wort gravity, and other brewing parameters. Due to the removal of hop vegetative matter during processing, LUPOMAX® pellets will impart less green/grassy character than traditional T90 pellets or whole cone hops. This should be taken into consideration during recipe development. Brewing efficiency and yield should increase with less beer loss when using LUPOMAX® enriched pellets in place of traditional hop pellets or cones.

## PACKAGING

LUPOMAX® pellets are packed in laminated foils with an aluminum layer as a barrier against diffusion of oxygen. They are sealed under inert gas or vacuum packed. The foil material used meets all food industry packaging regulations. The residual oxygen content in the foil packs is less than 2% by volume. Standard pack size is 5 kg.

## STORAGE AND BEST-BY RECOMMENDATION

LUPOMAX® pellets should be stored cold at 0 - 5 °C (32 - 41 °F) and are best when used within three years after processing. If stored at -20 °C (-4 °F) they should be used within five years. Foils, once opened, should be used within a few days to avoid deterioration of hop resins and essential oils.

## HOP DETERIORATION DURING STORAGE AND SHIPPING

Hop Product	Storage at up to 30°C	Cold Storage at 3 °C
<b>Cones (3 months storage)</b>	22 %	5 %
<b>Pellets (1 year storage)</b>	12 %	3-6 %

**Table 1:  $\alpha$ -Acid losses in % relative during different storage conditions [1]**

Shipping Temperature	Alpha Losses
<b>Up to 25°C</b>	3-6 %
<b>Up to 30°C</b>	5-8 %
<b>Up to 35 °C</b>	6-10 %
<b>&gt; 35°C</b>	Up to 15 %

**Table 2: Alpha-acid losses during overseas transportation in % relative [2]**



## ANALYTICAL METHODS

The determination of  $\alpha$  -acids in LUPOMAX® hop pellets can be measured by standard ASBC or EBC methods employing HPLC, spectrophotometric, or conductometric techniques:

- HPLC, using the current ICE standard, according to ASBC Hops-14 or EBC 7.7 ( $\alpha$ - and  $\beta$  -acids)
- Spectrophotometric according to ASBC Hops-6 ( $\alpha$ - and  $\beta$  -acids)
- Conductometric according to EBC 7.5 ( $\alpha$  -acids as lead conductometric value (LCV))
- Hop oil concentration in LUPOMAX® hop pellets can be measured by:
  - ASBC Hops-13 and Hops-17
  - EBC 7.10 and 7.12

## SAFETY

If dust is generated, it is advisable to use a dust mask. Hop pellets are a combustible material. For further information please download the relevant Safety Data Sheet (SDS).

## TECHNICAL SUPPORT

We will be pleased to offer help and advice on the use of LUPOMAX® enriched hop pellets in brewing.

E-Mail: [Brewingsolutions@barthhaas.de](mailto:Brewingsolutions@barthhaas.de)

## REFERENCE

1. Biendl M, Engelhard B, Forster A, et al (2012) Hopfen: vom Anbau bis zum Bier. Hans Carl GmbH, Nürnberg
2. Forster A (2002) What happens to hop pellets during unexpected warm phases? Brauwelt Int 43-46